

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

THOMAS SWAN & CO. LTD.,	§	
	§	
<i>Plaintiff,</i>	§	
	§	
v.	§	Civil Action No. 2:13-cv-00178-JRG
	§	
FINISAR CORP., et al.,	§	
	§	
<i>Defendants.</i>	§	

MEMORANDUM OPINION AND ORDER

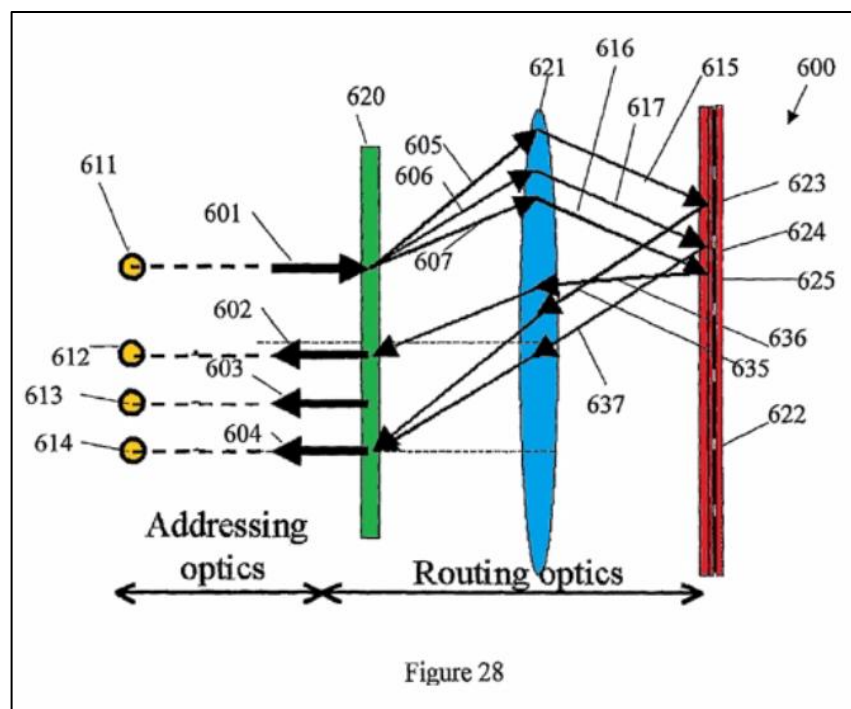
On May 30, 2014, the Court held a hearing to determine the proper construction of the disputed claim terms in United States Patent Nos. 8,335,033 (“the ’033 patent”); 8,089,683 (“the ’683 patent”); 7,664,395 (“the ’395 patent”); and 7,145,710 (“the ’710 patent”) (collectively, the “patents-in-suit”). After considering the arguments made by the parties at the hearing and in the parties’ claim construction briefing (Dkt. Nos. 124, 135, 139, 151 and 156), the Court issues this Claim Construction Memorandum and Order.

I. BACKGROUND

The patents-in-suit are titled “Optical Processing” and generally relate to the architecture and operation of an optical switch, such as the one shown in Figure 28.¹

¹ The Abstract of the ’710 Patent follows:

To operate an optical device comprising an SLM with a two-dimensional array of controllable phase-modulating elements groups of individual phase-modulating elements are delineated, and control data selected from a store for each delineated group of phase-modulating elements. The selected control data are used to generate holograms at each group and one or both of the delineation of the groups and the selection of control data is/are varied. In this way upon illumination of the groups by light beams, light beams emergent from the groups are controllable independently of each other.



The specification describes that the switch uses a dispersion device 620 (shown in green), a focusing element 621 (shown in blue), and a Spatial Light Modulator (“SLM”) 622 (shown in red), arranged in a folded architecture. ’710 Patent at 43:41–43.

The specification states that the SLM 622 “may be a multiple phase liquid crystal over silicon spatial light modulator having plural pixels, of a type having an integrated wave plate and a reflective element, such that successive passes of a beam through the liquid crystal subject each orthogonally polarised component to a substantially similar electrically-set phase change.” *Id.* at 7:1–6. The specification describes that the dispersion element 620 splits the multi-wavelength beam 601 into single wavelength beams 605, 606, 607, which are directed by the focusing element 621 to respective pixel groups 623, 624, 625 on the SLM 622. *Id.* at 43:49–60. The specification further states that the different pixel groups of the SLM display respective phase modulating patterns, known as holograms, which provide routing and other processing functions for the reflected beams 635, 636, 637. *Id.* The specification adds that these functions may include multiplexing/demultiplexing, filtering, attenuation, or monitoring. *Id.* at 43:61–44:33.

The specification states that the processed beams are then routed back to the grating 620 via the focusing element 621, where they are combined and directed to one of the outputs 612-614. *Id.* at 43:55–63. Accordingly, the specification describes an optical switch that can route, add/drop, filter, and attenuate multiple wavelengths independently using holograms displayed on the SLM.

Plaintiff brings suit alleging infringement of 132 claims across the patents-in-suit. Claims 1 and 20 of the '395 Patent are representative of the asserted claims and recite the following elements (disputed terms in italics):

1. An optical routing module having at least one input and at least one output and operable to select between the outputs, the or each input receiving a respective light beam having an ensemble of different channels, the module comprising:
 - a *Spatial Light Modulator (SLM)* having a two dimensional array of *pixels*,
 - a *dispersion device* disposed to receive light from said at least one input and constructed and arranged to disperse light beams of different frequencies in different directions whereby different channels of said ensemble are incident upon respective different groups of the *pixels* of the *SLM*, and circuitry constructed and arranged to display *holograms* on the *SLM* to determine the channels at respective outputs.

20. The optical routing module of claim 1, further comprising a control device operable to delineate groups of individual phase-modulating elements; to select, from stored *control data*, *control data* for each group of phase-modulating elements; to generate from the respective selected *control data* a respective hologram at each group of phase-modulating elements; and to vary at least one of the delineation of the groups and the selection of *control data* whereby upon illumination of said groups by respective light beams, respective emergent light beams from the groups are controllable independently of each other.

II. APPLICABLE LAW

A. Claim Construction

“It is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’” *Phillips v. AWH Corp.*, 415 F.3d 1303,

1312 (Fed. Cir. 2005) (en banc) (quoting *Innova/Pure Water Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). To determine the meaning of the claims, courts start by considering the intrinsic evidence. See *id.* at 1313, *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 861 (Fed. Cir. 2004); *Bell Atl. Network Servs., Inc. v. Covad Commc'ns Group, Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001). The intrinsic evidence includes the claims themselves, the specification, and the prosecution history. See *Phillips*, 415 F.3d at 1314; *C.R. Bard, Inc.*, 388 F.3d at 861. Courts give claim terms their ordinary and accustomed meaning as understood by one of ordinary skill in the art at the time of the invention in the context of the entire patent. *Phillips*, 415 F.3d at 1312–13; *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1368 (Fed. Cir. 2003).

The claims themselves provide substantial guidance in determining the meaning of particular claim terms. *Phillips*, 415 F.3d at 1314. First, a term's context in the asserted claim can be very instructive. *Id.* Other asserted or unasserted claims can also aid in determining the claim's meaning because claim terms are typically used consistently throughout the patent. *Id.* Differences among the claim terms can also assist in understanding a term's meaning. *Id.* For example, when a dependent claim adds a limitation to an independent claim, it is presumed that the independent claim does not include the limitation. *Id.* at 1314–15.

“[C]laims ‘must be read in view of the specification, of which they are a part.’” *Id.* (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc)). “[T]he specification ‘is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.’” *Id.* (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)); *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002). This is true because a patentee may define his own

terms, give a claim term a different meaning than the term would otherwise possess, or disclaim or disavow the claim scope. *Phillips*, 415 F.3d at 1316. In these situations, the inventor’s lexicography governs. *Id.* The specification may also resolve ambiguous claim terms “where the ordinary and accustomed meaning of the words used in the claims lack sufficient clarity to permit the scope of the claim to be ascertained from the words alone.” *Teleflex, Inc.*, 299 F.3d at 1325. But, “[a]lthough the specification may aid the court in interpreting the meaning of disputed claim language, particular embodiments and examples appearing in the specification will not generally be read into the claims.” *Comark Commc’ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187 (Fed. Cir. 1998) (quoting *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1571 (Fed. Cir. 1988)); *see also Phillips*, 415 F.3d at 1323. The prosecution history is another tool to supply the proper context for claim construction because a patent applicant may also define a term in prosecuting the patent. *Home Diagnostics, Inc., v. Lifescan, Inc.*, 381 F.3d 1352, 1356 (Fed. Cir. 2004) (“As in the case of the specification, a patent applicant may define a term in prosecuting a patent.”).

Although extrinsic evidence can be useful, it is “less significant than the intrinsic record in determining the legally operative meaning of claim language.” *Phillips*, 415 F.3d at 1317 (quoting *C.R. Bard, Inc.*, 388 F.3d at 862). Technical dictionaries and treatises may help a court understand the underlying technology and the manner in which one skilled in the art might use claim terms, but technical dictionaries and treatises may provide definitions that are too broad or may not be indicative of how the term is used in the patent. *Id.* at 1318. Similarly, expert testimony may aid a court in understanding the underlying technology and determining the particular meaning of a term in the pertinent field, but an expert’s conclusory, unsupported assertions as to a term’s definition are entirely unhelpful to a court. *Id.* Generally, extrinsic

evidence is “less reliable than the patent and its prosecution history in determining how to read claim terms.” *Id.*

B. Construction Indefiniteness

Patent claims must particularly point out and distinctly claim the subject matter regarded as the invention. 35 U.S.C. § 112(b). Whether a claim meets this definiteness requirement is a matter of law. *Young v. Lumenis, Inc.*, 492 F.3d 1336, 1344 (Fed. Cir. 2007). A party challenging the definiteness of a claim must show it is invalid by clear and convincing evidence. *Id.* at 1345. The ultimate issue is whether someone working in the relevant technical field could understand the bounds of a claim. *Haemonetics Corp. v. Baxter Healthcare Corp.*, 607 F.3d 776, 783 (Fed. Cir. 2010). Specifically, “[a] patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus Inc. v. Biosig Instruments, Inc.*, 572 U.S. ___, 134 S. Ct. 2120, 2124 (2014).

III. CONSTRUCTION OF AGREED TERMS

The parties have agreed to the construction of the following terms:

Claim Term/Phrase	Agreed Construction
“sensors for detecting temperature change”	“two or more sensors for detecting temperature change”
“temperature responsive devices constructed and arranged to feed signals indicative of device temperature to said control circuit”	“two or more temperature responsive devices constructed and arranged to feed signals indicative of device temperature to said control circuit”
“arbitrary shape”	“any shape”
“LCOS”	“Liquid Crystal On Silicon”
“WDM”	“Wavelength Division Multiplexing”
“rectangle”	“four-sided figure with four right angles”

“multiplex of optical signals”	“ensemble of optical signals”
“means for delineating a respective group of controllable elements for each chosen location whereby the light from said locations is determined by the size, shape or position of said groups”	<p>Function: delineating a respective group of controllable elements for each chosen location whereby the light from said locations is determined by the size, shape or position of said groups</p> <p>Corresponding Structure: control circuit (e.g., processing circuit 42 of Fig. 6) that delineates groups of controllable elements for each chosen location whereby the light from said locations is determined by the size, shape or position of said groups</p>
“specularly reflected”	“reflected in a manner that a mirror reflects”
“performing said varying step in response to the outputs of those sensors”	“varying the delineation of the groups or the selection of control data in response to the outputs of those two or more sensors”
“control circuit being responsive to signals from the sensor devices to vary said delineation and/or said selection”	“control circuit being responsive to signals from the two or more sensor devices to vary said delineation and/or said selection”
“delineation of the group boundaries in response to signals from sensors arranged to provide signals indicative of said emergent beams”	“delineation of the group boundaries in response to signals from two or more sensors arranged to provide signals indicative of said emergent beams”
“determining, by means of a control device, selection of the groups, selection of control data and delineation of the group boundaries in response to signals from sensors arranged to provide signals indicative of said emergent beams”	“determining, by means of a control device, selection of the groups, selection of control data and delineation of the group boundaries in response to signals from two or more sensors arranged to provide signals indicative of said emergent beams”
“two[-]dimensional array”	“an arrangement of two or more elements in each of two dimensions”
“two[-]dimensional array of pixels”	“an arrangement of two or more pixels in each of two dimensions”
“two-dimensional group(s)”	“a group of two or more elements arranged in each of two dimensions”

“common point on the dispersion device”	“common location on the dispersion device”

Joint Claim Construction and Prehearing Statement (Dkt. No. 119), at 2-4; *see also* Defendants’ Responsive Claim Construction Brief (Dkt. No. 135), at 1 n.3.² In view of the parties’ agreements on the proper construction of each of the identified terms, the Court hereby **ADOPTS AND APPROVES** the parties’ agreed constructions.

IV. CONSTRUCTION OF DISPUTED TERMS

The parties’ dispute focuses on the meaning and scope of 24 terms/phrases in the patents-at-issue.

A. “SLM / Spatial Light Modulator”

<u>Disputed Term</u>	<u>Plaintiff’s Proposal</u>	<u>Defendants’ Proposal</u>
SLM / Spatial Light Modulator	a device that modifies a property of light as a function of time and position across it	a device that modifies a property of light as a function of time and position across the device, and is at least somewhat polarisation-independent

The parties agree that the term “SLM” or “Spatial Light Modulator” should be construed as “a device that modifies a property of light as a function of time and position across the device.” The parties dispute whether the construction should require the SLM to be “at least somewhat polarisation-independent,” as Defendants propose. Plaintiff argues that the intrinsic evidence makes clear that a polarization-independent SLM is only one embodiment and that the claims are not limited to this one embodiment. (Dkt. No. 124 at 15.)

² All cites refer to the page number included in the document as filed and not the Court’s ECF page number.

Specifically, Plaintiff contends that the specification explicitly contemplates SLMs that use either polarization-dependent or polarization-independent liquid crystal materials. (Dkt. No. 124 at 15.) Plaintiff also argues that the specification demonstrates that the inventor contemplated polarization-dependent embodiments and that the specification does not require limiting the SLM itself to polarization-independent operation. (Dkt. No. 124 at 15.) Plaintiff further argues that the prosecution history shows that the patents-at-issue contemplate the use of both polarization-dependent and polarization-independent SLMs. (Dkt. No. 124 at 17–19.) Plaintiff also contends that Defendants cannot show that the patents-in-suit clearly and unmistakably disavow the ordinary meaning of SLM, which does not require polarization independence. (Dkt. No. 124 at 19–21.) Finally, Plaintiff argues that the doctrine of claim differentiation also counsels against importing the “polarization independent” limitation into the term “SLM.” (Dkt. No. 124 at 21.)

Defendants respond that all of the relevant intrinsic evidence and Plaintiff’s pre-litigation statements support Defendants’ construction that requires the SLM to be at least somewhat polarization-independent. (Dkt. No. 135 at 1–2.) Specifically, Defendants argue that the specification allows a variety of SLM structures to be used in the invention so long as those SLMs are at least somewhat polarization-independent (*i.e.*, are not polarization-dependent). (Dkt. No. 135 at 2.) Defendants also contend that Plaintiff’s documents show that both Plaintiff and the patentee viewed the invention of the patents-in-suit as limited to polarization-independent SLMs. (Dkt. No. 135 at 2–3.)

Defendants further argue that Plaintiff takes the intrinsic evidence out of its proper context to support its arguments. (Dkt. No. 135 at 3–5.) Defendants contend that every single embodiment of the invention described in the specification uses a polarization-independent

SLM, and that the specification repeatedly emphasizes that the invention is carried out through polarization-independent SLMs. (Dkt. No. 135 at 5–6.) Defendants further argue that Plaintiff misconstrues the file history, and that neither the Restriction Requirement nor the arguments regarding the prior art indicates that the claimed invention includes polarization-dependent SLMs. (Dkt. No. 135 at 9–11.) Finally, Defendants contend that Plaintiff’s claim differentiation argument is misplaced because the dependent claims are narrower than the independent claims. (Dkt. No. 135 at 12.)

Plaintiff replies that Defendants are using a single sentence from the specification to limit the patents to the very specific, “polarization-independent” structure. (Dkt. No. 139 at 4–5.) Plaintiff argues that Defendants misread the next sentence, which states that the invention can be applied to other “devices.” (Dkt. No. 139 at 5.) Plaintiff contends that the term “devices” refers to other optical devices—such as routers, multiplexers, filters, etc.—that could use the SLM-containing “invention.” (Dkt. No. 139 at 5–6.) Plaintiff further argues that claim 1 must be broad enough to cover any type of SLM, both polarization-independent and polarization-dependent material, and is not limited to a disclosed embodiment. (Dkt. No. 139 at 6.)

Plaintiff further argues that Defendants’ characterization of the Weiner reference and its use by the examiner in the prosecution of the ’395 patent is misleading. (Dkt. No. 139 at 6.) Plaintiff also argues that Defendants mischaracterize their argument with respect to the Amako reference and that the examiner’s withdrawal of the Restriction Requirement in the ’395 patent does not alter or rebut its argument. (Dkt. No. 139 at 7.) Finally, Plaintiff contends that Defendants put inordinate weight on the internal Thomas Swan documentation. (Dkt. No. 139 at 7.) Plaintiff argues that even if this extrinsic evidence reflects the inventor’s view of the scope of the invention, “it is not unusual for there to be a significant difference between what an

inventor thinks his patented invention is and what the ultimate scope of the claims is after allowance by the PTO.” (Dkt. No. 139 at 7) (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 985 (Fed. Cir. 1995)).

For the following reasons, the Court finds that **“SLM / Spatial Light Modulator”** should be construed to mean **“a device that modifies a property of light as a function of time and position across the device.”**

1. The Intrinsic Evidence

The Court first turns to the language of the claims, as it provides “substantial guidance as to the meaning of particular claim terms.” *Phillips*, 415 F.3d at 1313 (citing *Vitronics*, 90 F.3d at 1582). The term “Spatial Light Modulator” or “SLM” appears in claims 1, 3, 11, 12, and 14 of the ’710 Patent; claims 1, 4, 5, 21, 24, and 27 of the ’395 Patent; claims 6, 17, 18-20, 25, 27-29, 35, 37, 38, and 40-44 of the ’683 Patent; and claims 1-4, 19, 21, 23-25, 29, 56, 57, 60, 63, 64, 66, 68, 71-73, 76, and 91 of the ’033 Patent. The Court finds that the term is used consistently in the claims and is intended to have the same meaning in each claim.

Defendants argue that the intrinsic evidence indicates that the patentee disclaimed polarization-dependent SLMs. The Court disagrees and finds that the intrinsic record does not include a “clear and unmistakable” disavowal of polarization-dependent SLMs. *Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1325-1326 (Fed. Cir. 2003) (“[F]or prosecution disclaimer to attach, our precedent requires that the alleged disavowing actions or statements made during prosecution be both clear and unmistakable.”); *see also Home Diagnostics, Inc. v. LifeScan, Inc.*, 381 F.3d 1352, 1358 (Fed. Cir. 2004) (“Absent a clear disavowal in the specification or the prosecution history, the patentee is entitled to the full scope of its claim language.”).

First, the specification describes that in a preferred embodiment the SLM includes an integrated quarter-wave plate that enables the SLM to be polarization-independent. '710 Patent at 12:9–64, Figure 1. Immediately following this description, the specification states that the invention is not limited to this embodiment or to any particular SLM structure. Specifically, the specification states the following:

It is not intended that any particular SLM structure is essential to the invention, the above being only exemplary and illustrative. The invention may be applied to other devices, provided they are capable of multiphase operation and are at least somewhat polarisation independent at the wavelengths of concern. Other SLMs are to be found in our co-pending applications WO 01/25840, EP1050775 and EP1053501 as well as elsewhere in the art.

'710 Patent at 12:65–13:5 (emphasis added). Defendants contend that the second sentence in this paragraph indicates that the recited SLM is required to be “at least somewhat polarisation independent.” The Court disagrees with Defendants’ conclusion and finds that the specification refers to “other devices” in this sentence and not specifically to an “SLM.” This word choice is significant because a person of ordinary skill in the art could understand that the word “device” refers to the optical device as a whole (i.e., SLM, gratings, focusing devices, and input and outputs), and not just the SLM. Indeed the specification refers to “optical devices” that include more than just the SLM. *See, e.g.*, '710 Patent at 4:19–51 (describing “an optical device comprising an SLM and a control circuit,” data “store,” “sensor devices arranged to detect light emergent from the SLM,” and “temperature responsive devices”); 5:13–27 (describing “an optical device comprising one or more inputs . . . , a diffraction grating . . . , a focusing device and a continuous array of phase modulating elements . . . [and] one or more output[s]”); 5:55–59 (describing an add/drop multiplexer having “a reflective SLM, . . . diffraction device, and a focusing device”). Thus, the alleged disclaimer is ambiguous at best and does not rise to the level of a clear disavowal. *Thorner v. Sony Computer Entm't Am. LLC*,

669 F.3d 1362, 1366–1367 (Fed. Cir. 2012) (“To constitute disclaimer, there must be a clear and unmistakable disclaimer.”)

Moreover, it is well established that in the absence of a clear intention to limit claim scope, the description of a preferred embodiment is an insufficient basis on which to narrow the claims. *See Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004). Here, the specification does not describe a polarization-independent SLM as the “invention,” but instead uses permissive language and refers to this property as an option in certain preferred embodiments. *See, e.g.*, ’710 Patent at 40:12–14 (“*In the preferred embodiment*, the S[L]M 320 is a continuous pixel array of phase-modulating elements and is polarisation independent.”) (emphasis added); 2:31–33 (“It is desirable *for certain applications* that a method or device for addressing these issues should be polarisation-independent, or have low polarisation-dependence.”); 4:8–10 (“The SLM *may be* integrated on a substrate and have an integral quarter-wave plate whereby it is substantially polarisation insensitive”). As indicated by these examples, the specification does not indicate a clear intent to limit the scope of the claims to the preferred embodiments.

Likewise, the Court finds that the doctrine of claim differentiation indicates that the “polarization independent” limitation should not be read into the term “SLM.” Specifically, dependent claim 4 of the ’395 patent recites that “the SLM is integrated on a substrate and has an integrated quarterwave plate whereby it is substantially polarisation insensitive.” Similarly, dependent claim 8 of the ’710 patent recites “wherein the two dimensional SLM having an array of pixels is a reflective SLM incorporating a wave-plate whereby the reflective SLM is substantially polarisation independent.” The Court finds that the reference to “polarisation insensitive” or “polarisation independent” in these dependent claims indicates that the SLM

recited in the independent claims is not required to be “polarization-independent.” Specifically, these dependent claims serve to narrow the independent claims to the preferred embodiment by requiring the SLM to be “polarisation insensitive” or “polarisation independent.” Thus, the claim language also indicates that the “polarisation-independent” limitation should not be read into the term “SLM.”

Finally, Defendants do not point to any statements in the prosecution history as indicating that the patentee disclaimed polarization-dependent SLMs. Instead, it is Plaintiff that argues that the prosecution history indicates that the examiner understood that the claims were directed to both polarization-dependent and polarization-independent SLMs. Having reviewed the prosecution history, the Court finds that whether the claims are limited to SLMs that are polarization-independent was not directly addressed by the examiner.³ Accordingly, the Court finds that the patentee did not limit the scope of the claims to polarization-independent SLMs.

2. Court’s Construction

In light of the intrinsic evidence, the Court construes **“SLM / Spatial Light Modulator”** to mean **“a device that modifies a property of light as a function of time and position across the device.”**

³ The only mention of a polarization-independent SLM is when the examiner entered a Restriction Requirement contending that the application contained claims directed to patentably distinct species: (1) devices that utilize a polarization-independent SLM having a wave plate; and (2) devices that utilize an LCOS SLM. (Dkt. No. 124-17 at 2, ’395 Prosecution History, Jan. 13, 2009 OA.) The patentee argued in response that an SLM that “uses a wave plate and is polarization independent is not mutually exclusive with an SLM that is an LCOS SLM.” (Dkt. No. 124-18 at 2.) The examiner later removed the Restriction Requirement, but his reason for doing so is not clear.

B. “hologram” terms

<u>Disputed Term</u>	<u>Plaintiff’s Proposal</u>	<u>Defendants’ Proposal</u>
hologram(s)	a modulation pattern (e.g., a phase ramp)	indefinite <i>To the extent the Court determines that a construction is ascertainable:</i> the ideal set of phase modulation values for achieving a desired change in incident light
actual holograms	Plain and ordinary meaning in light of other constructions proposed herein (e.g., hologram)	indefinite <i>To the extent the Court determines that a construction is ascertainable:</i> sets of phase modulation values that are derived from and are the closest available approximations to the respective ideal sets of phase modulation values adapted to the physical limitations of the SLM
generat[ed/ing a] hologram	Plain and ordinary meaning in light of other constructions proposed herein (e.g., hologram)	indefinite <i>To the extent the Court determines that a construction is ascertainable:</i> determin[ed/ing the] ideal set of phase modulation values for achieving a desired change in incident light using an ideal SLM (i.e., having a continuously variable limitless phase modulation ability)
combined hologram	Plain and ordinary meaning in light of other constructions proposed herein (e.g., hologram)	Indefinite <i>To the extent the Court determines that a construction is ascertainable:</i> a “generated hologram” formed by combining two or more “generated holograms” for achieving two or more different desired types of changes in incident light

Defendants contend that the “hologram(s)” terms, as recited in all of the patents-in-suit, and the terms “actual holograms,” “generat[ed/ing a] hologram,” and “combined hologram,” as recited in the claims of the ’710 Patent, are indefinite. In the alternative, Defendants contend that the term “hologram(s)” should be construed as “the ideal set of phase modulation values for achieving a desired change in incident light.” Plaintiff disagrees that the terms are indefinite and contends that the term “hologram(s)” should be construed as “a modulation pattern (*e.g.*, a phase ramp).” Plaintiff also contends that the terms “actual holograms,” “generat[ed/ing a] hologram,” and “combined hologram” should be given their plain and ordinary meaning in light of the proposed construction for “hologram.”

Specifically, Plaintiff argues that the specification uses the term “hologram” to refer to modulation patterns that are generated from control data and displayed by a SLM to perform various processing operations on the incident light. (Dkt. No. 124 at 5–6.) Plaintiff also contends that prior art references in the intrinsic record support its construction of “hologram” as a modulation pattern. (Dkt. No. 124 at 6–7.) Thus, Plaintiff argues that the intrinsic evidence demonstrates that the term “hologram” has been consistently used in the art to refer to a modulation pattern and is not “insolubly ambiguous.” (Dkt. No. 124 at 7.)

Plaintiff further argues that Defendants’ construction contradicts the intrinsic evidence because there is nothing in the intrinsic record that requires the “set” of values to be “ideal.” (Dkt. No. 124 at 8–9.) Plaintiff also argues that the other “hologram” terms do not require further construction, especially in view of the surrounding claim language the provides further guidance as to the meaning of these terms. (Dkt. No. 124 at 9.)

Defendants respond that the patents-in-suit use the term “hologram” ambiguously to refer to an ideal set of phase modulation values, information representing phase change data, and an

image displayed on a SLM. (Dkt. No. 135 at 13.) Defendants argue that using the same word to mean such distinct concepts renders the term “hologram” indefinite. (Dkt. No. 135 at 13–14.) Defendants further argue that Plaintiff’s reliance on the cited prior art is misplaced because the cited references show that the term hologram is used ambiguously in the art. (Dkt. No. 135 at 14.)

In the alternative, Defendants argue that the intrinsic record shows that (1) generating a hologram involves a mathematical calculation of an ideal set of phase modulation values for achieving a desired change in incident light from which (2) an actual hologram may be provided based on the physical limitations of the SLM. (Dkt. No. 135 at 15–16.) Defendants argue that Plaintiff’s position fails to appreciate that the patent specification distinguishes between generating holograms, which are idealized calculations, and actual holograms, which are approximations derived from those ideal values that may be displayed. (Dkt. No. 135 at 16–17.)

Defendants also argue that Plaintiff’s construction of “hologram” as “modulation pattern” is inconsistent with how the term is used in the specification, which repeatedly refers to a “hologram pattern.” Finally, Defendants contend that Plaintiff improperly extracts the words “generated,” “actual” and “combined” from the hologram terms in claiming that only the word “hologram” requires construction. (Dkt. No. 135 at 17–18.) Defendants argue that a “generated hologram” is a completely different hologram from an “actual hologram.” (Dkt. No. 135 at 18.)

Plaintiff replies that Defendants’ Inter Partes Review (“IPR”) petitions contradict their assertion that the scope of the term “hologram” is “unascertainable to one of skill in the art.” (Dkt. No. 139 at 1.) Plaintiff contends that Dr. Katie Hall, Finisar’s expert in its IPR petitions, testified that hologram generation was “well understood” and that a person of ordinary skill would understand “hologram” to be any one of a phase equation, pattern, or change data. (Dkt.

No. 139 at 1.) Plaintiff argues that Dr. Hall’s opinion closely tracks and confirms its proposed definition. (Dkt. No. 139 at 1.) Plaintiff further argues that Defendants’ assertion that “hologram” is “inherently indefinite in the liquid crystal SLM field” is contradicted by Defendant Finisar’s own documents and patents that show that holograms and holographic switching are well-understood and commonly used in the field of SLMs. (Dkt. No. 139 at 2.)

Plaintiff also replies that Defendants’ alternative construction of “hologram” is wrong because it requires a “hologram” to be “ideal” for all of the asserted claims. (Dkt. No. 139 at 2.) Plaintiff contends that although claim 1 of the ’710 Patent recites “generating holograms,” many of the ’395 Patent, ’683 Patent, and ’033 Patent claims are completely agnostic as to how the holograms are created. (Dkt. No. 139 at 2–3.) Thus, according to Plaintiff, Defendants’ “ideal” limitation is wrong because it contradicts the specification and excludes embodiments covered by the claims of the ’395 Patent, ’683 Patent, and ’033 Patent. (Dkt. No. 139 at 3.) Finally, Plaintiff argues that Finisar’s technical expert recognized that “holograms” are “patterns.” (Dkt. No. 139 at 3.)

For the following reasons, the Court finds that **“hologram(s)”** should be construed as **“phase modulation pattern(s) used to control light incident upon the SLM.”** The Court also finds that the terms **“actual hologram,” “generat[ed/ing a] hologram,”** and **“combined hologram”** should be given their **plain meaning** to one of ordinary skill in the art.

1. The Claim Language

The terms “actual hologram,” “generat[ed/ing a] hologram,” and “combined hologram” appear only in the claims of the ’710 Patent.⁴ The term “hologram” appears in claims 1, 3-6, 10,

⁴ The term “actual hologram” appears in claim 3 of the ’710 Patent. The term “generat[ed/ing a] hologram” appears in claims 1, 3, 4, 5, and 10 of the ’710 Patent. The term “combined hologram” appears in claim 10 of the ’710 Patent.

11, and 14 of the '710 Patent; claims 1 and 20 of the '395 Patent; claims 20-25, 28-30, 33, 37, 38, and 40-44 of the '683 Patent; claims 1-5, 8-18, 26-27, 29-31, 53, 54, 57, 60, 63, 64, 66, 68, 71-73, 76, and 91 of the '033 Patent. The Court finds that the term “hologram(s)” is used consistently in all of the claims of the patents-in-suit and is intended to have the same meaning in each claim.

As an initial matter, the Supreme Court recently held that the “amenable to construction” or “insolubly ambiguous” formulations for resolving a definiteness challenge lacks the precision §112, ¶2 demands. *Nautilus Inc. v. Biosig Instruments, Inc.*, 572 U.S. ___, 134 S. Ct. 2120, 2124 (2014). Thus, the Supreme Court replaced the “insolubly ambiguous” standard and held “that a patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Id.*

Under the new standard, the Court finds that the disputed terms are not indefinite. First, all of the claims indicate that hologram is used to control light incident upon the SLM. For example, claim 1 of the '710 Patent recites “generating ... a respective hologram at each group of phase-modulating elements ... whereby upon illumination of said groups by respective light beams, respective emergent light beams from the groups are controllable independently of each other.” Likewise, claim 20 of the '395 Patent recites generating “a respective hologram at each group of phase-modulating elements ... whereby upon illumination of said groups by respective light beams, respective emergent light beams from the groups are controllable independently of each other.” Similarly, claim 22 of the '683 Patent recites displaying “a hologram on at least one of said respective blocks of pixels to deflect a beam incident upon said block of pixels in a predetermined direction.” Finally, claim 1 of the '033 Patent recites “wherein the processor is

configured such that the controllable elements display different holograms at chosen locations of the SLM where said light is incident, for controlling directions at which light from respective said locations emerges.” Thus, the plain language of the claims informs, with reasonable certainty, those skilled in the art about the scope of the invention because they indicate that the recited holograms are used to control light incident upon the SLM.

Moreover, the disputed terms “actual hologram” and “combined hologram” appear only in dependent claims of the ’710 Patent. The plain language of these dependent claims merely introduces different types of holograms. Contrary to Defendants’ contentions, specifying different types of holograms in the dependent claims does not render the term “hologram” indefinite. For example, dependent claim 3 of the ’710 Patent introduces an “actual hologram” and a “generated hologram,” and recites that the “actual hologram” is derived from the “generated hologram.” Likewise, dependent claim 10 recites that “providing control data indicative of two holograms to be displayed by said group and generating a combined hologram before said resolving step.” All of these types of holograms ultimately are used to control light incident upon the SLM, and there is nothing inconsistent with construing the broader term “hologram” as a pattern used to control light incident upon the SLM.

Moreover, the plain language of the claims indicate that the common words “generated,” “actual,” and “combined,” do not require further construction, especially in view of the surrounding claim language that provides further guidance as to the meaning of these terms. For example, a jury will have no trouble understanding that the “actual hologram” is derived from the “generated hologram” because this is explicitly recited in the claim. Moreover, Defendants’ constructions would confuse rather than clarify the scope of these terms for the jury. Accordingly, the Court will now turn to the remaining intrinsic evidence.

2. The Intrinsic Evidence

The specification uses the term “hologram” to refer to patterns that are generated from control data and displayed by a SLM to perform various processing operations on the incident light. For example, the specification states that control data “is processed to generate holograms which are applied to the SLM 10 for control of light incident upon the SLM 10.” ’710 Patent at 13:15–18. Likewise, the specification states the following regarding the control of light incident upon the SLM:

Linear phase modulation, or an approximation to linear phase modulation may be used to route a beam of light, i.e. to select a new direction of propagation for the beam. In many routing applications, two SLMs are used in series, and the displayed information on the one has the inverse effect to the information displayed on the other. *Since the information represents phase change data, it may be regarded as a hologram.* Hence an output SLM may display a hologram that is the inverse of that displayed on the input SLM.

’710 Patent at 7:16–29 (emphasis added). Similarly the specification states “the method further comprises selecting by a discrete approximation to a linear phase modulation, a routing hologram for display by the SLM whereby the beams may be correctly routed.” ’710 Patent at 9:42–47. As a final example, the specification references Figure 3 and states that “a routing device 25 includes two SLMs 20, 21 which display holograms for routing light 1, 2 from an input fibre array 3,4 to an output fibre array 5, 6.” ’710 Patent at 16:6–8. Thus, all of these examples inform, with reasonable certainty, those skilled in the art about the scope of the invention because they indicate that the hologram is used to control light incident upon the SLM.

In addition to the portions of the specification discussed above, the specification further describes the recited hologram as a phase modulation pattern. For example, the specification states “each active processing operation (routing, power control, monitoring, etc.) requires an associated hologram pattern to be applied by the controller but may be carried out by the same SLM” ’710 Patent at 44:28–32. The specification also discusses non-linear phase

modulation and describes the hologram as a “hologram pattern associated with any general non-linear phase modulation” ’710 Patent at 14:44–45. Likewise, the specification references Figure 29 and states that the “pixel block 723 applies the required hologram pattern that routes a channel entering the add port 701 to the main output 704, and also routes a channel entering the main input 702 to the drop port 703.” ’710 Patent at 48:53–56. Accordingly, in view of the intrinsic evidence, a person of ordinary skill in the art would understand that the recited “hologram” is a “phase modulation pattern used to control light incident upon the SLM.”

Finally, the Court is not persuaded by Defendants’ argument that because the term “hologram” has different meanings in different contexts, the scope of alleged invention unascertainable to one of skill in the art. Importantly, the Supreme Court in *Nautilus* recognized that the definiteness inquiry does not require “absolute precision” because, for example, the statute “must take into account the inherent limitations of language” and “[s]ome modicum of uncertainty . . . is the price of ensuring the appropriate incentives for innovation.” *Nautilus*, 134 S. Ct. at 2128-29 (internal citation and quotation omitted). Moreover, the Court declined to adopt a test that would render a claim invalid when “readers could reasonably interpret the claim’s scope differently.” *Id.*

For the reason stated above, the claims of the patents-in-suit, when read in light of the specification and the prosecution history, inform, with reasonable certainty, those skilled in the art about the scope of the invention. *Georgia-Pacific Corp. v. United States Plywood Corp.*, 258 F.2d 124, 136 (2d Cir.), *cert. denied*, 358 U.S. 884 (1958) (“If the claims, read in the light of the specifications, reasonably apprise those skilled in the art both of the utilization and scope of the invention, and if the language is as precise as the subject matter permits, the courts can demand no more.”)

Likewise, the Court rejects Defendants' contention that the term "hologram" must be construed as "an ideal set of phase modulation values." Although the specification describes a process of calculating an ideal set of phase modulation values for achieving a desired change in incident light, and then deriving a set of phase modulation values that are the closest available approximations to the ideal set, the Court finds that the claims are not limited as proposed by Defendants. *See, e.g.*, '710 Patent at 21:25–29 ("The processing circuitry 82 calculates the ideal linear phase ramp to route the beams . . . and resolves this phase modulo 2π . The processing circuitry at each of the pixels then selects the closest available phase level to the ideal value").

First, as discussed above, it is only the dependent claims in the '710 Patent that introduce different types of holograms. Further specifying different types of holograms does not require reading unnecessary limitations into the broader term "hologram." Indeed, based on Defendants' construction, independent claim 1 of the '710 Patent and the claims in the other patents-in-suit would require an "ideal" set of values. However, none of the claims that use the term "hologram" require the displayed holograms to be "ideal."

In fact, the specification repeatedly sets forth examples where the displayed holograms are approximations of ideal modulation patterns. *See, e.g.*, '710 Patent at 9:43–47 ("[T]he method further comprises selecting by a discrete approximation to a linear phase modulation, a routing hologram for display by the SLM whereby the beams may be correctly routed."); 8:64–65 ("Compensating holograms are formed as a result of the discrete approximations of the non-linear modulation."); 14:16–19 ("In such systems the available phase level nearest to the value of the desired modulo- 2π modulation at the centre of each pixel (as described above) should be used as a first approximation."); 14:14–23 ("In such systems the available phase level nearest to the value of the desired modulo- 2π modulation at the centre of each pixel (as described above)

should be used as a first approximation.”); 14:30–34 (“The additional input 16 causes the processing circuitry 11 to modify the holograms displayed by applying a discrete approximation of a non-linear phase modulation . . .”). Thus, Defendants’ construction that requires a “hologram” to be an “ideal” set would exclude preferred embodiments in which the SLM displays approximated holograms. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583–84 (Fed. Cir. 1996)) (stating that a claim construction that excludes the preferred embodiment “is rarely, if ever, correct and would require highly persuasive evidentiary support.”).

Moreover, each of the recited holograms are ultimately used to control light incident upon the SLM, and there is nothing inconsistent with construing the term “hologram” as a phase modulation pattern used to control light incident upon the SLM. Indeed, the surrounding claim language provides further guidance as to the meaning of the different types of holograms recited in the dependent claims of the ’710 Patent. Accordingly, the plain language of the claims indicate that the common words “generated,” “actual,” and “combined,” do not require further construction.

Finally, prior art references cited in the intrinsic record are consistent with the Court’s construction. For example, the article titled “WDM Channel Management Using Programmable Holographic Elements” explains that “[t]he use of an electrically addressed SLM (EASLM), to display a desired phase pattern, provides a programmable grating (i.e., a hologram).” (Dkt. No. 124-4 at TS0018686.) Similarly, U.S. Patent No. 6,975,786 explains that “[t]he hologram device . . . displays a holographic pattern of phase and/or intensity and/or birefringence that has been designed to produce a specific deflection of the optical propagation directions of the beams incident upon the device.” (Dkt. No. 124-7 at 7:14–18.) These references confirm that a person

of ordinary skill in the art would understand a “hologram” to be a “phase modulation pattern used to control light incident upon the SLM.”

3. The Extrinsic Evidence

Defendants argue that the extrinsic evidence indicates that the word “hologram” is used inconsistently by those skilled in the liquid crystal SLM art. (Dkt. No. 135 at 15.) Thus, according to Defendants, the term “hologram” is inherently indefinite in the claims in question. (Dkt. No. 135 at 15.) The Court disagrees and finds Defendants’ argument divorced from the intrinsic evidence. Accordingly, for the reasons stated above, the Court finds that the intrinsic evidence informs, with reasonable certainty, those skilled in the art about the scope of the invention.

4. Court’s Construction

In light of the intrinsic and extrinsic evidence, the Court construes **“hologram(s)”** to mean **“phase modulation pattern(s) used to control light incident upon the SLM.”** In light of the Court’s construction for “hologram,” the Court concludes that the disputed terms “actual hologram,” “generat[ed/ing a] hologram,” and “combined hologram” are unambiguous, are easily understandable by a jury, and require no construction. Therefore, the phrases **“actual hologram,” “generat[ed/ing a] hologram,”** and **“combined hologram”** will be given their **plain meaning** to one of ordinary skill in the art.

C. “pixel”

<u>Disputed Term</u>	<u>Plaintiff’s Proposal</u>	<u>Defendants’ Proposal</u>
pixel	the smallest element of a display surface that can be assigned independent characteristics	the smallest element of the SLM that can be independently controlled

The parties agree that a pixel is “the smallest element.” The parties dispute whether a “pixel” is “the smallest element of a display surface that can be assigned independent characteristics,” as Plaintiff proposes, or is “the smallest element of the SLM that can be independently controlled,” as Defendants propose. Plaintiff contends that the specification does not explicitly define the term “pixel,” and thus refers to the cited EPO Application No. WO/0207987010 as illustrating what a “pixel” is in the context of a typical two-dimensional SLM. (Dkt. No. 124 at 21.) Plaintiff also provides a dictionary definition in support of its construction. (Dkt. No. 124 at 22.) Plaintiff further argues that Defendants’ construction is imprecise because it encompasses various non-displaying components of the SLM, such as transistors and their driving circuitry. (Dkt. No. 124 at 22.)

Defendants respond that the specification and claims repeatedly indicate that a “pixel” is an element of the SLM, and not a “display surface.” (Dkt. No. 135 at 25.) Defendants also argue that the specification clearly states that a pixel is independently controlled. (Dkt. No. 135 at 25.) Defendants further argue that Plaintiff’s construction of “pixel” imposes limitations that are completely unsupported by the specification. (Dkt. No. 135 at 25.)

Plaintiff replies that Defendants do not address its argument that Defendants’ construction would encompass non-displaying, yet independently controlled “smallest elements of the SLM,” such as transistors. (Dkt. No. 139 at 7–8.) Plaintiff argues that its construction clarifies that a “pixel” refers to the smallest element of the SLM’s display surface and is not just some arbitrary, non-displaying element of the SLM. (Dkt. No. 139 at 8.)

For the following reasons, the Court finds that **“pixel”** should be construed to mean **“the smallest element of a display that can be independently controlled.”**

1. The Intrinsic Evidence

The term “pixel” appears in claims 1, 4, 5, 11-19, 21, 23, 24, and 27 of the ’395 Patent; and claims 19-29 and 37-44 of the ’683 Patent. The Court finds that the term is used consistently in the claims and is intended to have the same meaning in each claim. In addition, the Court finds that the claims indicate that the pixel is an element of a display that can be independently controlled. For example, claim 1 of the ’395 Patent recites “a Spatial Light Modulator (SLM) having a two dimensional array of pixels,” which includes “circuitry constructed and arranged to display holograms on the SLM.” Likewise, claim 20 of the ’683 Patent recites that control circuitry divides “the reflective LCOS SLM into discrete blocks of pixels” and “display(s) holograms on respective blocks of pixels.” Similarly, claim 19 of the ’395 Patent indicates that the pixels can be independently controlled by reciting that “each group of pixels comprises a plurality of subgroups, wherein at least one subgroup is controlled so as to have a phase effect different to at least one other subgroup.” Thus, the claims indicate that a pixel is “an element of a display that can be independently controlled.”

The specification further confirms this construction by stating that “[t]he invention further relates to an optical routing module, ... the module comprising a two dimensional SLM having an array of pixels, with circuitry constructed and arranged to display holograms on the pixels to route beams of different frequency to respective outputs.” ’710 Patent at 6:13–19. Similarly, the specification describes that “an optical system 80 includes an SLM 81 for routing beams 1,2 of light from input fibres 3,4 to output fibres 5,6 by means of holograms displayed on pixel groups 13,14 of the SLM.” ’710 Patent at 21:16–19. The specification further states that each pixel may be independently controlled by circuitry connected “to the pixel electrodes 230 so that different selected voltages are applied between respective pixel electrodes 230 and the

common electrode layer 224.” ’710 Patent at 12:34–37. Consistent with the claims, the Court finds that the specification indicates that the recited “pixel” is the smallest element of a display that can be independently controlled. The Court further finds that Defendants’ construction is too broad because it could encompass various non-displaying components of the SLM. Accordingly, the Court does not adopt Defendants’ construction because it fails to capture this aspect of the recited pixels.

2. The Extrinsic Evidence

To support its construction, Plaintiff cites to the dictionary definition of the word “pixel” provided in The Authoritative Dictionary of IEEE Standards Terms. (Dkt. No. 124 at 22.) This dictionary defines “pixel” as “the smallest element of a display surface that can be assigned independent characteristics; this term is derived from the term ‘picture element.’” (Dkt. No. 124-24 at TS0104957.) This definition is consistent with the parties’ agreement that a pixel is “the smallest element.” The definition is also consistent with the Court’s construction that the pixel is the “smallest element of a display.” However, because the intrinsic evidence does not mention “a display surface,” and discloses controlling pixels instead of assigning “independent characteristics,” the Court finds that the term “pixel” should be construed as the smallest element of a display that can be independently controlled.

3. Court’s Construction

In light of the intrinsic and extrinsic evidence, the Court construes **“pixel”** to mean **“the smallest element of a display that can be independently controlled.”**

D. “control data”

<u>Disputed Term</u>	<u>Plaintiff’s Proposal</u>	<u>Defendants’ Proposal</u>
control data	data from which a hologram is generated	No construction required

The parties dispute whether the term “control data” requires construction. Defendants contend that the term does not require construction. Plaintiffs contend that the phrase should be construed as “data from which a hologram is generated.” Plaintiff argues that term “control data” as used in the patents-in-suit is closely related to the term “hologram.” (Dkt. No. 124 at 9.) Plaintiff argues that the plain language of the claims makes clear that “control data” is the data from which a hologram is generated. (Dkt. No. 124 at 10.) Plaintiff further argues that the specification also supports its construction by repeatedly stating that holograms are generated from “control data.” (Dkt. No. 124 at 10.) Plaintiff concludes that the jury will benefit from an additional clarification of what “control data” means by further clarifying the relationship between “control data” and “hologram.” (Dkt. No. 124 at 11.)

Defendants respond that “control” and “data” are both common, everyday English words that together mean, “data used to control [something],” and do not require a special definition in this case. (Dkt. No. 135 at 26–27.) Defendants further argue that Plaintiff’s construction only leads to confusion, as it does not attempt to define the word “data,” and excludes any notion of “control.” (Dkt. No. 135 at 27.) Finally, Defendants contend that Plaintiff’s construction improperly contradicts the plain language of the specification and the claims by limiting the scope of the term “control data” to only one type of control data. (Dkt. No. 135 at 27.)

Plaintiff replies that the specification always discloses control data in the context of its use for generating holograms. (Dkt. No. 139 at 3.) Plaintiff contends that the portions of the specification cited by Defendants are actually examples of control data used for generating

holograms with corrective or beam steering effects—not evidence against Plaintiff’s proposed construction.

For the following reasons, the Court finds that **“control data”** should be construed to mean **“data used to control an element.”**

1. The Intrinsic Evidence

The term “control data” appears in claims 1, 6, 10, 11, and 14 of the ’710 Patent; claim 20 of the ’395 Patent; and claims 30, 31, 47, 50- 52, 54, 55, 60, 62, 73, 75, and 91 of the ’033 Patent. The Court finds that the term is used consistently in the claims and is intended to have the same meaning in each claim. The Court also finds that the plain language of the claims recite that the “control data” is data used to control an element. For example, claim 1 of the ’710 Patent recites “[a] method of operating an optical device comprising an SLM having a two-dimensional array of controllable phase-modulating elements, the method comprising ... selecting ... control data for each group of phase-modulating elements.” Likewise, claim 30 of the ’033 Patent recites “[t]he optical processor of claim 29 having control circuitry operable to select controllable elements to delineate said two-dimensional groups of controllable elements, and to vary one of the delineation of the groups and the selection of control data.” Thus, the plain language of the claims indicate that the recited “control data” is data used to control an element. In the case of claim 1 of the ’710 Patent, the elements that are controlled are the phase-modulating elements.

The specification further discusses using “control data” to control an element by stating that “an optical device comprising an SLM with a two-dimensional array of controllable phase-modulating elements ... and control data selected from a store for each delineated group of phase-modulating elements.” ’710 Patent at Abstract. In describing a second aspect of the

invention, the specification discloses “an optical device comprising an SLM and a control circuit, the SLM having a two-dimensional array of controllable phase-modulating elements and the control circuit having a store constructed and arranged to hold plural items of control data ... for each group of phase-modulating elements.” ’710 Patent at 4:19–29. Accordingly, the specification indicates that the recited “control data” is data used to control an element.

Finally, Defendants agree that “control data” means “data used to control [something].” (Dkt. No. 135 at 26.) As discussed above, the intrinsic evidence indicates that this “something” is the controllable elements. Moreover, the Court’s construction does not exclude the notion of control that Defendants found lacking in Plaintiff’s construction. Finally, unlike Plaintiff’s construction, the Court’s construction does not repeat what is explicitly stated in the claims. For example, claim 1 of the ’710 Patent explicitly recites “generating ... a respective hologram,” and including this language in the construction only confuses the claim language instead of clarifying it.⁵

2. Court’s Construction

In light of the intrinsic evidence, the Court construes **“control data”** to mean **“data used to control an element.”**

⁵ Substituting Plaintiff’s construction into this claim phrase reads, “generating from the respective selected [data from which a hologram is generated] a respective hologram at each group of phase-modulating elements.” In contrast, the claim is not confusing when the Court’s construction is substituted into this claim phrase: “generating from the respective selected [data used to control an element] a respective hologram at each group of phase-modulating elements.”

E. “dispersion device”

<u>Disputed Term</u>	<u>Plaintiff’s Proposal</u>	<u>Defendants’ Proposal</u>
dispersion device	a device that spreads out a light beam into spectral components	a device that separates a light beam into spectral components

The parties dispute whether a dispersion device “is a device that spreads out a light beam,” as Plaintiff proposes, or is a device “that separates a light beam,” as Defendants propose. Plaintiff contends that its construction is helpful to the jury because it explains that “dispersion” of light is a physical process that involves spreading the light spectrum in different directions. (Dkt. No. 124 at 28.) Plaintiff contends that dispersion is only one of several mechanisms for separating light into components and that Defendants’ construction eliminates the concept of “dispersion.” (Dkt. No. 124 at 29.) Thus, Plaintiff argues that Defendants’ construction reads out “dispersion” from the claim language in an attempt to encompass devices that separate light without dispersing it. (Dkt. No. 124 at 29.)

Defendants agree with Plaintiff that an effect of dispersion is that spectral components of a light beam spread out at an angle. (Dkt. No. 135 at 27.) However, Defendants argue that in order for the spreading to occur, the light beam must be first separated. (Dkt. No. 135 at 28.) Defendants further contend that dispersion is a well-known optical phenomenon, defined consistently in many dictionaries and encyclopedias; and, that the specification of the patents-in-suit uses the term consistently with its well-understood meaning in the industry. (Dkt. No. 135 at 28.) Moreover, Defendants do not dispute that other optical devices, *e.g.*, filters, can separate light without dispersion. (Dkt. No. 135 at 28.) Instead, Defendants argue that dispersion does separate light into its spectral components and that Plaintiff’s argument explicitly admits that “dispersion” is a “mechanism for separating light.” (Dkt. No. 135 at 28.)

Plaintiff replies that Defendants' construction is wrong because it impermissibly encompasses optical devices, such as optical filters, that separate light without performing dispersion as required by the claims. (139 at 10.)

For the following reasons, the Court construes finds that **“dispersion device”** should be construed to mean **“a device that separates and spreads a light beam into spectral components.”**

1. The Intrinsic Evidence

The term “dispersion device” appears in claims 1-3, 6, 7, 24, and 27 of the '395 Patent; and claims 1, 20, 21, 29, 32, 60, 63, 66, 68, 71, 72, 73, 76, and 91 of the '033 Patent. The Court finds that the term is used consistently in the claims and is intended to have the same meaning in each claim. The Court further finds that the claims recite that a diffraction grating is a type of “dispersion device.” For example, claim 3 of the '395 Patent recites “wherein the dispersion device comprises at least one of: a blazed grating, a holographic grating, an etched grating, an arrayed waveguide grating and a prism.” Furthermore, the specification states that the diffraction grating functions to split a beam into separate beams. *See, e.g.*, '710 Patent at 39:56–59 (“As a result of the grating 300 the beam 301 is split into separate beams 301a, 301b, 301c for each wavelength channel, each travelling in a different direction governed by the grating equation), 43:49–52 (“The grating 620 splits the incoming beam 601 to provide three single wavelength emergent beams 605, 606, 607 each angularly offset by a different amount, and incident on the lens 621.”). Thus, the Court finds that “dispersion device” should be construed to mean “a device that separates and spreads a light beam into spectral components.”

2. The Extrinsic Evidence

The Court's construction is consistent with the extrinsic evidence submitted by the parties. For example, Defendants provide a dictionary definition from The Oxford Dictionary of

Physics (4th ed. 2000) that defines “dispersion” as “the splitting up of a ray of light of mixed wavelengths by refraction into its components.” (Dkt. No. 135, Ex. 20 at FinTS00045339). Similarly, the American Heritage Dictionary of Science (1986) defines “disperse” as “*1 Physics. a to divide (light or other electromagnetic radiation) into its different wavelengths; refract: If a ray of white light is incident on the water surface ... it splits after passing through the water surface into a group of colored rays ... The white ray is said to be dispersed* (Shortley and Williams, *Elements of Physics*).” (Dkt. No. 135, Ex.18 at FinTS00045326) (emphasis in original). Accordingly, the Court finds that the extrinsic evidence confirms that a person of ordinary skill in the art would understand that a “dispersion device” is “a device that separates and spreads a light beam into spectral components.”

3. Court’s Construction

In light of the intrinsic and extrinsic evidence, the Court construes “**dispersion device**” to mean “**a device that separates and spreads a light beam into spectral components.**”

F. “*holographic grating*”

<u>Disputed Term</u>	<u>Plaintiff’s Proposal</u>	<u>Defendants’ Proposal</u>
holographic grating	a grating made from a material whose optical properties are changed by exposure to light	indefinite <i>To the extent the Court determines that a construction is ascertainable:</i> a grating made holographically

Defendants contend that the term “holographic grating” recited in claim 3 of the ’395 Patent is indefinite. (Dkt. No. 135 at 18.) In the alternative, Defendants contend that the term “holographic grating” should be construed as “a grating made holographically.” (Dkt. No. 135 at 18.) Plaintiff disagrees that the term is indefinite and contends that the term “holographic

grating” should be construed as “a grating made from a material whose optical properties are changed by exposure to light. (Dkt. No. 124 at 11.) Specifically, Plaintiff argues that claim 3 of the ’395 Patent identifies “holographic grating” as one of several types of diffraction gratings that can comprise the dispersion device of claim 1. (Dkt. No. 124 at 11.) Plaintiff further argues that the specification explains that diffraction gratings can be “made by ruling or from a master, or made holographically, or by etching.” (Dkt. No. 124 at 11) (quoting ’710 Patent at 39:39–42). Plaintiff also contends that the term “holographic grating” has an accepted scientific meaning in the field of optics and that its construction is faithful to both the intrinsic evidence and technical literature, and would help the jury understand the meaning of this technical term. (Dkt. No. 124 at 11.)

Plaintiff further argue that Defendants cannot meet the clear and convincing standard required for proving indefiniteness because a skilled artisan could discern its boundaries based on the intrinsic evidence, as well as his knowledge of optics. (Dkt. No. 124 at 12.) Plaintiff adds that Defendants’ indefinite assertion is disingenuous because their alternate construction uses the word “holographically,” which is the word that Defendants contend renders the disputed term indefinite. (Dkt. No. 124 at 12.)

Defendants respond that the only passage describing a holographic grating in the specification states that it is a grating “made holographically.” (Dkt. No. 135 at 18.) Defendants also argue that Plaintiff describes its extrinsic evidence by using the words “patterns,” “recorded on,” and “photographic films” but none of these terms appear in its abstract construction. (Dkt. No. 135 at 18.) Thus, according to Defendants, Plaintiff’s construction refuses to adopt what it describes as the supposed “accepted scientific meaning.” (Dkt. No. 135 at 18.)

Plaintiff replies that Defendants disingenuously maintain that the term “holographic grating” is indefinite to one of ordinary skill, even though “holographic gratings” are well-known optical components. (Dkt. No. 139 at 4.) Plaintiff also argues that Defendant Finisar uses “holographic gratings” as a component in its products and Defendant Finisar’s CTO, Dr. Frisken, discusses holographic gratings in an article he authored. (Dkt. No. 139 at 4.) Thus, according to Plaintiff, the term “holographic grating” is neither unclear to Defendants nor to those of ordinary skill in the field of optics. (Dkt. No. 139 at 4.)

For the following reasons, the Court finds that **“holographic grating”** should be construed to mean **“a grating made by recording periodic interference patterns.”**

1. The Intrinsic Evidence

The term “holographic grating” appears in claim 3 of the ’395 Patent. As noted by Plaintiff, claim 3 identifies “holographic grating” as one of several types of diffraction gratings that can comprise the “dispersion device” of claim 1. Consistent with claim 3, the specification identifies different types of diffraction gratings (i.e., dispersion devices) “made by ruling, or from a master, or made holographically, or by etching.” ’710 Patent at 39:39–42. Thus, in light of the Court’s construction for the term “dispersion device,” the Court finds that the intrinsic evidence identifies the different types of gratings by the way they are made or manufactured. However, Defendants’ construction of “a grating made holographically” is circular and would not clarify the term for the jury. Accordingly, the Court will now turn to the extrinsic evidence.

2. The Extrinsic Evidence

Plaintiff submits excerpts from technical literature to support its contention that the term “holographic grating” is not indefinite. The first is a book titled “Diffraction Gratings Handbook” and includes a section titled “Holographic Gratings,” which states the following:

Since the late 1960s, a method distinct from mechanical ruling has also been used to manufacture diffraction gratings. This method involves the photographic recording of a stationary interference fringe field. Such *interference gratings*, more commonly (though inaccurately) known as *holographic gratings*, have several characteristics that distinguish them from ruled gratings.

Dkt. No. 124-9 at TS0104930 (emphasis in original). The section also includes a sub-section titled “Principle of Manufacture,” which discusses the formation of interference patterns and how “the combined intensity varies sinusoidally with position as the interference pattern is scanned along a line.” (Dkt. No. 124-9 at TS0104930.) The second book is titled “Elements of Modern Optical Design” and describes the manufacturing process as follows:

In addition to mechanical methods, *gratings are now manufactured by holographic techniques, whereby periodic interference patterns are recorded on photographic films.* If these holographic gratings are recorded on emulsion thicker than the wavelength of the exposing radiation, then they can also behave like blazed gratings. Just as with the mechanically ruled gratings, the geometry of the grating illumination is critical to achieving high efficiency.

Dkt. No. 124-10 at TS0104939 (emphasis added). Finally, Plaintiff submits a portion of a paper authored by Defendant Finisar’s CTO, Dr. Frisken, that discusses the operation of a disperse-and-switch WSS and states that “[t]he dispersive mechanism is generally based on holographic or ruled diffraction grating similar to those used commonly in spectrometers.” (Dkt. No. 139, Ex. 3 at FinTS00045759.)

Thus, the Court finds that the extrinsic evidence indicates that the term “holographic grating” is commonly used and understood by a person of ordinary skill in the art. Additionally, Court finds that the extrinsic evidence is consistent with the intrinsic evidence, which identifies “holographic grating” as one of several types of diffraction gratings and distinguishes them by the manner in which they are made. Moreover, the extrinsic evidence further states that holographic gratings are made by recording periodic interference patterns on a medium. Accordingly, the Court finds that the term is not indefinite and that a person of ordinary skill in

the art would understand that a “holographic grating” is “a grating made by recording periodic interference patterns.” Finally, the Court agrees with Defendants that the extrinsic evidence uses the words “patterns” and “recorded on,” but that none of these terms appear in Plaintiff’s construction. Therefore, the Court does not adopt either parties’ construction.

3. Court’s Construction

In light of the intrinsic and extrinsic evidence, the Court construes “**holographic grating**” to mean “**a grating made by recording periodic interference patterns.**”

G. “the optical signals of the multiplex”

<u>Disputed Term</u>	<u>Plaintiff’s Proposal</u>	<u>Defendants’ Proposal</u>
the optical signals of the multiplex	Plain and ordinary meaning in light of other constructions proposed herein (<i>e.g.</i> , multiplex of optical signals)	the optical signals within the ensemble

The parties dispute whether the phrase “the optical signals of the multiplex” requires construction. Plaintiff contends that it does not require construction in light of the parties’ agreed construction for the phrase “multiplex of optical signals.” (Dkt. No. 124 at 26.) Plaintiff further argues that Defendants’ proposed construction re-writes the claim by changing a common English article “of” to “within” without any justification. (Dkt. No. 124 at 26.) Plaintiff argues that there is nothing in the claims, specification, or prosecution history of the ’683 Patent that would require changing “of” to “within.” (Dkt. No. 124 at 26.)

Defendants respond that Plaintiff has taken the erroneous position that the reception and separation functions need only be performed on individual optical signals, and not the ensemble as a whole. (Dkt. No. 135 at 19.) Thus, according to Defendants, their construction uses the term “within” to indicate that the certain functions in the claim are operative on the optical signals in an ensemble, and not merely individual optical signals. (Dkt. No. 135 at 19.)

Defendants contend that their construction is dictated by the claim language because the term “the optical signals of the multiplex” has antecedent basis in the phrase “a multiplex of optical signals at different wavelengths in a common beam.” (Dkt. No. 135 at 19.) Defendants also argue that the claim requires the function of separation to be performed on a plurality of signals because an individual optical signal cannot be separated “into at least two groups.” (Dkt. No. 135 at 19–20.)

Defendants further argue that the specification supports their construction because it traces the language in claim 18, and makes clear that the “separation” function must be performed on “these optical signals” that are in the “multiplex.” (Dkt. No. 135 at 19) (quoting ’710 Patent at 2:18–21). Defendants further argue that the prosecution history supports their contention that the reception and separation requirements must be performed on the set of the optical signals within the multiplex. (Dkt. No. 135 at 20–21.) Finally, Defendants contend that Plaintiff is mischaracterizing its construction and that the term “within” clarifies for the jury that those functions must be performed on the same set of multiplexed signals. (Dkt. No. 135 at 21.)

Plaintiff replies that nothing in claim 18 requires the LCOS SLM to receive optical signals that are still within the multiplex (i.e., in the undispersed multiplexed beam) and to disperse the multiplex into individual optical signals. (Dkt. No. 139 at 9.) Plaintiff argues that dependent claims 20, 25, 28, 29, 37, 38, and 40–44 all recite a distinct “wavelength separation device disposed to receive light from the input and operable to disperse the multiplex of optical signals,” which means that the SLM of claim 18 does not physically disperse the multiplexed beam. (Dkt. No. 139 at 9.) Plaintiff further contends that the specification never describes the SLM as a component that disperses the multiplexed beam, instead this operation is performed by the dispersion device in front of the SLM. (Dkt. No. 139 at 9.) Finally, Plaintiff contends that

the prosecution history also confirms that the applicant and examiner understood that the recited SLM operated on the individual optical signals, not the multiplexed beam as a whole. (Dkt. No. 139 at 9–10.)

For the following reasons, the Court find that **“the optical signals of the multiplex”** should be construed to mean **“at least two optical signals from the ensemble of optical signals.”**

1. The Intrinsic Evidence

The phrase “the optical signals of the multiplex” appears only in claim 18 of the ’683 Patent. As indicated above, the parties have agreed that “multiplex of optical signals” should be construed as “ensemble of optical signals.” This agreed phrase also appears in claim 18 and the disputed phrase references this “multiplex of optical signals at different wavelengths in a common beam.” Thus, the two phrases are referring to signals from the ensemble of optical signals. The issue before the Court is whether the phrase refers to a subset of the signals in the ensemble or to the ensemble as a whole. When considered in the context of the intrinsic evidence, the Court finds that the phrase is not referring to the ensemble as a whole, but instead is referring to at least two optical signals from the ensemble.

Specifically, dependent claims 20, 25, 28, 29, 37, 38, 40-44 all recite a distinct “wavelength separation device disposed to receive light from the input and operable to disperse the multiplex of optical signals.” This indicates that the recited SLM of claim 18 does not physically disperse the multiplexed beam, but rather logically separates the received optical signals into at least two groups and processes them differently. Furthermore, the specification does not describe the SLM as a component that disperses the multiplexed beam, instead this

operation is performed by the dispersion device in front of the SLM. *See, e.g.*, '683 Patent, Figures 12, 28, and 29.

Finally, the prosecution history also confirms that the patentee understood that the recited SLM operated on the individual optical signals, not the multiplexed beam as a whole. Indeed, the patentee specifically amended claim 18 to clarify that it is the “the device input” that receives “the multiplex of optical signals,” not the SLM, and that it is the SLM that receives “the optical signals of the multiplex,” and not the “multiplex of optical signals.” (Dkt. No. 139, Ex. 9 at TS0001822.) In other words, the intrinsic evidence indicates that the claims only require the SLM to receive at least two optical signals from the ensemble of optical signals, and not the ensemble of optical signals as whole.

2. Court’s Construction

In light of the intrinsic evidence, the Court construes **“the optical signals of the multiplex”** to mean **“at least two optical signals from the ensemble of optical signals.”**

H. “sensor devices”

<u>Disputed Term</u>	<u>Plaintiff’s Proposal</u>	<u>Defendants’ Proposal</u>
sensor devices arranged to detect light emergent from the SLM	two or more sensor devices arranged to detect light emergent from the SLM (as construed herein)	two or more sensor devices arranged to detect light originating from an input fiber and emergent from the SLM
light sensor arranged to provide signals indicative of emergent light	Plain and ordinary meaning	light sensor arranged to provide signals indicative of light originating from an input fiber and emergent from the SLM
light sensor arranged to provide signals indicative of light specularly reflected at the SLM	Plain and ordinary meaning in light of other constructions proposed herein (<i>e.g.</i> , specularly reflected)	light sensor arranged to provide signals indicative of light originating from an input fiber specularly reflected at the SLM

The parties agree that when a claim recites the term “sensor devices” in the plural, this term means “two or more.” The parties dispute whether the “sensor devices” should be construed to include the origin of the emergent light (i.e., “originating from an input fiber”), as Defendants propose. Plaintiff contends that the claims do not require defining where the emergent light must originate. (Dkt. No. 124 at 25.) Plaintiff argues that these terms are focused on the sensors and claim the light to which they are configured to monitor. (Dkt. No. 124 at 25.) Thus, according to Plaintiff, neither the claim language nor the specification requires such a re-writing of the claims. (Dkt. No. 124 at 26.)

Defendants respond that the specification teaches the use of optical sensors within the claimed invention in order to monitor the input signals and adapt the SLM. (Dkt. No. 135 at 22.) Defendants contend that every light sensor embodiment measures signal light that originates from an input beam that traverses the system, and that Plaintiff does not cite any support that light beams may be anything but light coming from an input fiber or beam. (Dkt. No. 135 at 22.)

Plaintiff replies that Defendants do not attempt to address its primary argument that the claim language is silent as to the origin of the light emergent from (or specularly reflected at) the SLM. (Dkt. No. 139 at 8.) Plaintiff argues that the specification teaches alternative sources of the light and that the claims are not limited to “light originating from an input fiber.” (Dkt. No. 139 at 8–9.) Therefore, according to Plaintiff, even if the claim language required the origin of the emergent/reflected light, Defendants’ construction would still be incorrect as it improperly imports embodiments from the specification. (Dkt. No. 139 at 9.)

For the following reasons, the Court finds that the phrases **“sensor devices arranged to detect light emergent from the SLM,” “light sensor arranged to provide signals indicative of emergent light,”** and **“light sensor arranged to provide signals indicative of light**

specularly reflected at the SLM” should be given their **plain meaning** to one of ordinary skill in the art.

1. The Intrinsic Evidence

The phrase “sensor devices arranged to detect light emergent from the SLM” appears in dependent claim 12 of the ’710 Patent, which is dependent upon independent claim 11. The phrase “light sensor arranged to provide signals indicative of emergent light” appears in claim 22 of the ’033 Patent, which is dependent upon independent claim 1. The phrase “light sensor arranged to provide signals indicative of light specularly reflected at the SLM” appears in claim 23 of the ’033 Patent, which is dependent upon dependent claim 22. The Court finds that the phrase “input fiber” does not appear in any of the claims at issue, in either the independent or dependent claims. In fact, it is independent claim 14 of the ’710 Patent that recites an “SLM being disposed to receive respective light beams from an input fibre array.”⁶ Thus, the claim language indicates that claims should not be re-drafted to include “light originating from an input fiber,” as Defendants propose. Indeed, if the patentee intended to include this language in the claims she would have explicitly done so as she did in claim 14 of the ’710 Patent. Instead, the claims only recite detecting emergent light or light specularly reflected.

Likewise, the specification does not require re-drafting the claim language to include “light originating from an input fiber.” Defendants are correct that a number of the disclosed embodiments measures signal light that originate from an input beam that traverses the system. However, the claim language is not so limited and one of the disclosed embodiments discloses more than one SLM, with the output of one SLM providing the input to a third SLM, which “has

⁶ The specification associates “input beams” with “input fibres.” *See, e.g.*, ’710 Patent at 17:1–3 (“For example consider coupling from one input fibre (or input beam) through a routing system into the selected output fibre (or output beam)”).

monitor sensors 37 for sensing 40 light at predetermined locations.” ’710 Patent at 19:34–46, Figure 5. Likewise, another embodiment discloses that the “the sensors 48 may instead or also be remote from the SLM 40 to sense the effects of changes on the holograms at the SLM 40.” ’710 Patent at 21:13-15, Figure 6. Accordingly, the Court finds that the specification does not require re-drafting the claim language to include “light originating from an input fiber.” However, the Court notes that parties have agreed that “sensor devices” means “two or more sensor devices.” In light of the intrinsic evidence and the parties’ agreement, the disputed phrases are unambiguous, are easily understandable by a jury, and require no construction.

2. Court’s Construction

The Court finds that the phrases **“sensor devices arranged to detect light emergent from the SLM,” “light sensor arranged to provide signals indicative of emergent light,”** and **“light sensor arranged to provide signals indicative of light specularly reflected at the SLM”** are unambiguous, are easily understandable by a jury, and require no construction. Therefore, the phrases will be given their **plain meaning** to one of ordinary skill in the art.

I. “two dimensional [SLM/ Spatial Light Modulator] having an array of pixels”

<u>Disputed Term</u>	<u>Plaintiff’s Proposal</u>	<u>Defendants’ Proposal</u>
two dimensional [SLM/ Spatial Light Modulator] having an array of pixels	an SLM having an arrangement of two or more pixels in each of two dimensions	a device having an arrangement of two or more pixels that modifies a property of light in two dimensions as a function of time and position across the device, and is at least somewhat polarisation-independent

The parties dispute whether the phrase “two dimensional [SLM/ Spatial Light Modulator] having an array of pixels” requires the device to modify “a property of light in two dimensions,”

as Defendants propose.⁷ Plaintiff contends that Defendants are attempting to read a functional limitation into a term that describes a structural characteristic. (Dkt. No. 124 at 23.) Plaintiff notes that the parties have agreed that the term “two dimensional array of pixels” means “an arrangement of two or more pixels in each of two dimensions.” (Dkt. No. 124 at 23.) Plaintiff also argues that Defendants’ position contradicts Finisar’s representation to the Patent Office in connection with its IPR of the ’395 Patent. (Dkt. No. 124 at 23.) Plaintiff further argues that the prosecution history confirms that the phrase “two dimensional array of pixels” and the phrase “two dimensional SLM having an array of pixels” have the same meaning. (Dkt. No. 124 at 23–24.) Plaintiff also contends that the doctrine of claim differentiation is overcome by the specification and prosecution history, which show that the patentee intended both terms to be synonymous. (Dkt. No. 124 at 24.) Finally, Plaintiff argues that Defendants’ construction would read out the one-dimensional routing embodiment. (Dkt. No. 124 at 24–25.)

Defendants respond that “two dimensional SLM” is a term of art referring to an SLM that modulates (*i.e.*, affects a property of) light in two dimensions. (Dkt. No. 135 at 22–23.) Defendants note that all 176 claims of the asserted patents recite the term “SLM,” and that many contain the term SLM having a two dimensional array of pixels,” but only 5 claims recite “two dimensional SLM having an array of pixels.” (Dkt. No. 135 at 22–23.) Thus, according to Defendants, the court must presume that the use of different terms in the claims connotes different meanings. (Dkt. No. 135 at 23.) Defendants also argue that the specification discloses embodiments where the input signal is routed in two dimensions and is thus modulated in two dimensions. (Dkt. No. 135 at 23.)

⁷ The Parties’ dispute concerning the proper construction of “SLM” / “Spatial Light Modulator” was addressed by the term “SLM.”

Defendants further contend that the prosecution history for the '395 Patent demonstrates that the patentee intended for these phrases to have different meanings when the phrase “two dimensional SLM having an array of pixels” was replaced with “a Spatial Light Modulator (SLM) having a two dimensional array of pixels.” (Dkt. No. 135 at 23–24.) Finally, Defendants argue that their construction is consistent with Finisar’s position in the IPR because the cited disclosure in the Parker Thesis (and other references) shows both an SLM having a two dimensional array of pixels and routing in two dimensions. (Dkt. No. 135 at 24.)

Plaintiff replies that Defendants do not attempt to rebut the argument that their construction would impermissibly read a functional limitation into this term that is directed to structural characteristics. (Dkt. No. 139 at 11.) Plaintiff also replies that Defendants misinterpret the prosecution history leading to the '395 Patent in an attempt to improperly limit the scope of this claim. (Dkt. No. 139 at 11.) Plaintiff reiterates that the prosecution history indicates that the claim language originates from the patentee’s attempt to clarify the language. (Dkt. No. 139 at 11.)

For the following reasons, the Court finds that **“two dimensional [SLM/ Spatial Light Modulator] having an array of pixels”** should be construed as **“an SLM having an arrangement of two or more pixels in each of two dimensions.”**

1. The Intrinsic Evidence

The term “two dimensional [SLM/ Spatial Light Modulator] having an array of pixels” appears in claims 4, 5, 24, and 27 of the '395 Patent. The Court finds that the term is used consistently in the claims and is intended to have the same meaning in each claim. As indicated above, the parties have agreed that the recited Spatial Light Modulator (SLM) having “a two dimensional array of pixels” in independent claim 1 of the '395 Patent should be construed as

“an arrangement of two or more pixels in each of two dimensions.” The Court finds that the disputed phrase “two dimensional [SLM/ Spatial Light Modulator] having an array of pixels” relies on this agreed phrase for antecedent basis in dependent claims 4 and 5, and as noted above is intended to have the same meaning in all claims. Thus, the two phrases are referring to the same arrangement of two or more pixels in each of two dimensions, and the slightly different phraseology does not warrant reading a functional limitation into a structural term. *Ecolab, Inc. v. Envirochem, Inc.*, 264 F.3d 1358, 1367 (Fed. Cir. 2001) (“Where the function is not recited in the claim itself by the patentee, we do not import such a limitation.”).

In addition, the prosecution history confirms that the phrase “two dimensional array of pixels” and the phrase “two dimensional SLM having an array of pixels” have the same meaning. Specifically, in response to the examiner’s rejection of then pending claim 4 (which later issued as claim 1 of the ’395 patent), the patentee made an amendment to make clear that the language “a two-dimensional SLM” means “an SLM having a two-dimensional array of pixels.” (Dkt. No. 124-25 at TS0001480, ’395 Prosecution History, Aug. 6, 2009 Response to OA). In making this clarification, the patentee explained that “the SLM of Weiner . . . does not have a two-dimensional array of pixels.” (Dkt. No. 124-25 at 8.) This statement shows that the patentee distinguished the prior art based on structural grounds and not on the requirement that the device must modify a property of light in two dimensions. The fact that the patentee did not amend the same language in dependent claims 11 and 12 (which later issued as dependent claims 4 and 5) does not indicate that the patentee intended these phrases to have different meanings as suggested by Defendants. Moreover, the parties agree that the specification discloses embodiments where the input signal is routed in either one or two dimensions. Accordingly, there is no reason to exclude an SLM that has the capability of routing in two-dimensions from

routing in only one dimension, so long as the SLM has an arrangement of two or more pixels in each of two dimensions.

2. Court's Construction

In light of the intrinsic evidence, the Court construes the phrase **“two dimensional [SLM/ Spatial Light Modulator] having an array of pixels”** to mean **“an SLM having an arrangement of two or more pixels in each of two dimensions.”**

J. “guardband blocks”

<u>Disputed Term</u>	<u>Plaintiff's Proposal</u>	<u>Defendants' Proposal</u>
guardband blocks that are discrete from said blocks of pixels	Plain and ordinary meaning	two or more groups of pixels each of which is positioned between and not a part of said blocks of pixels
control the pixels in at least one guardband block to prevent light incident upon said guardband block from being directed to an output	Plain and ordinary meaning in light of other constructions proposed herein (<i>e.g.</i> , pixel)	vary the voltage on the pixels in at least one group of pixels positioned between and not a part of said blocks of pixels to prevent light incident upon said group from being directed to an output

The parties dispute whether the phrase “guardband blocks that are discrete from said blocks of pixels” and the phrase “control the pixels in at least one guardband block to prevent light incident upon said guardband block from being directed to an output” require construction. Plaintiff contends that the phrases do not require construction. Specifically, Plaintiff argues that the claim language is clear that “guardband blocks” are discrete from “said blocks of pixels” and prevent light incident thereon from being directed to an output. (Dkt. No. 124 at 27.) Plaintiff contends that Defendants’ construction improperly narrows claims 38 because the claim does not require the “guardband blocks” to be positioned in some specific location, as long as they are discrete from “said blocks of pixels.” (Dkt. No. 124 at 27.) Plaintiff also contends that the patents-in-suit disclose both an embodiment in which guardband blocks are located between

pixel blocks and an embodiment that has the blocks around each pixel area, not just between pixel areas. (Dkt. No. 124 at 27–28.) Thus, according to Plaintiff, importing a requirement for placing guardband blocks “between” pixel blocks would improperly read out one of the disclosed embodiments. (Dkt. No. 124 at 28.)

Defendants respond that the only disclosure in the specification concerning guardbands makes clear that they must be positioned between blocks of pixels. (Dkt. No. 135 at 26.) Defendants further contend that Plaintiff is misreading the specification by suggesting that it discloses another guardband embodiment where the guardband is not positioned between the pixel blocks. (Dkt. No. 135 at 26 n.32.) Defendants also argue that the extrinsic evidence presented by Plaintiff supports Defendants’ construction. (Dkt. No. 135 at 26.)

Plaintiff replies that Defendants confuse the purpose of guardbands with their physical location on the SLM. (Dkt. No. 139 at 10.) Plaintiff contends that guardbands prevent interference between channels, but their location is not fixed. (Dkt. No. 139 at 10.) Thus, according to Plaintiff, as long as they surround pixel groups with areas that attenuate or redirect light in a different direction they satisfy their purpose. (Dkt. No. 139 at 10.)

For the following reasons, the Court finds that **“guardband blocks”** should be construed as **“blocks of pixel that prevent interference between channels.”** The Court further finds that the phrase **“control the pixels in at least one guardband block to prevent light incident upon said guardband block from being directed to an output”** should be given its **plain meaning** to one of ordinary skill in the art.

1. The Intrinsic Evidence

The disputed phrases appear in claim 38 of the ’683 Patent. The claim language recites that the reflective SLM is divided into two distinct types of blocks: “discrete blocks of pixel” and “guardband blocks.” The claim language further recites that it is the discrete blocks of pixel that

display the holograms to determine channels output. Likewise, the claim language recites that it is pixels in the guardband block that prevent “light incident upon said guardband block from being directed to an output.” Thus, consistent with the specification, the claims recite the structure and purpose of the recited “guardband blocks.” That is, the guardband blocks are discrete from the other recited blocks and are used to prevent light from being directed to an output (i.e., to prevent interference between channels). The specification describes an example of the interference problem by stating “[t]he aberrated propagating waves may diffract into intensity fluctuations creating significant unwanted coupling of light into other output optical fibres, leading to levels of crosstalk that impede operation.” *See, e.g.*, ’710 Patent at 1:43–50.

Although the specification mentions that “guardbands” may be positioned between each block, it does not require the recited “guardbands blocks” to be positioned between each discrete blocks of pixels. ’710 Patent at 54:66–55:8. Indeed, the specification states “[a]lternatively guard bands can be used to route in a third direction to deliberately narrow a channel bandwidth, if required.” ’710 Patent at 54:66–55:8. Thus, the Court finds that Defendants’ construction confuses the purpose of guardbands with their physical location on the SLM. As long as the guardband blocks surround pixel groups with areas that redirect light in a different direction, then they satisfy their purpose. Accordingly, the Court finds that a person of ordinary skill in the art would understand that the recited “guardband blocks” are “blocks of pixel that prevent interference between channels.” In light of this construction, the phrase “control the pixels in at least one guardband block to prevent light incident upon said guardband block from being directed to an output” is unambiguous, is easily understandable by a jury, and requires no construction.

2. The Extrinsic Evidence

Plaintiff provides a dictionary definition that defines “guard band” as “[a]n unused portion of a frequency band used to separate different channels in the bandwidth to prevent mutual interference between adjacent channels.” (Dkt. No. 124-26 at TS0104926, The Penguin Dictionary of Telecommunications.) Consistent with the specification, this definition confirms that a person of ordinary skill in the art would understand that the recited “guardbands blocks” are blocks of pixel that prevent interference between channels.

3. Court’s Construction

In light of the intrinsic and extrinsic evidence, the Court construes **“guardband blocks” to mean “blocks of pixel that prevent interference between channels.”** In light of this construction, the Court finds that the phrase **“control the pixels in at least one guardband block to prevent light incident upon said guardband block from being directed to an output”** is unambiguous, is easily understandable by a jury, and requires no construction. Therefore, the phrase will be given its **plain meaning** to one of ordinary skill in the art.

K. “substantially” and “approximately”

<u>Disputed Term</u>	<u>Plaintiff’s Proposal</u>	<u>Defendants’ Proposal</u>
light from a common point on the dispersion device is substantially collimated	light from a common location on the dispersion device is largely collimated	indefinite
substantially reflective	largely reflective	indefinite
approximately a desired passband of a respective channel	close to a desired passband of a respective channel; a “channel” is a band of frequencies	indefinite
approximately a desired center wavelength of a respective channel	close to a desired center wavelength of a respective channel; a “channel” is a band of frequencies	indefinite

substantially at the centers of the respective different blocks of pixels	largely at the centers of the respective different blocks of pixels (as construed herein)	indefinite
a substantially non-reflective optical absorber	a largely non-reflective optical absorber	indefinite
substantially flat transmission between one or more pairs of adjacent channels at the output	largely flat transmission between one or more pairs of adjacent channels at the output; a “channel” is a band of frequencies	indefinite
reflects substantially all of an incident light beam	reflects largely all of an incident light beam	indefinite
substantially collimated by the focusing device when incident upon the SLM	largely collimated by the focusing device when incident upon the SLM (as construed herein)	indefinite

Defendants contend that a number of phrases that include either “substantially” or “approximately” are indefinite because they fail to objectively define the level at which the term “substantially” or “approximately” would be satisfied. (Dkt. No. 135 at 29.) Regarding the “substantially” phrases, Defendants contend that Plaintiff has failed to identify any portions of the specification that allegedly provide a standard for determining what is encompassed by each of the various uses of the term “substantially.” (Dkt. No. 135 at 19.) Defendants note that Plaintiff’s brief fails to cite any passage from the specification for these terms. (Dkt. No. 135 at 19.) Defendants further argue that Plaintiff’s suggestion that “substantially” means “largely” does not alleviate the ambiguity, and does not provide notice of the boundaries of what is claimed. (Dkt. No. 135 at 30.)

Regarding the “approximately” phrases, Defendants argue that Plaintiff has not pointed to anywhere in the specification that advises one of skill in the art how much latitude should be afforded by the term “approximately.” (Dkt. No. 135 at 30.) Defendants argue that there is no

indication that one of ordinary skill would know where to draw the line regarding the scope of “approximately a desired passband” and “approximately a desired center wavelength” because “approximately” is an entirely subjective “desired” matter. (Dkt. No. 135 at 30.) Therefore, according to Defendants, none of the cases cited by Plaintiff apply to the use of “approximately” in these claims, and there is no way to tell from the patents what are the boundaries of “approximately a desired [something].” (Dkt. No. 135 at 30.)

Plaintiff contends that when read in light of the claims, one of skill in the art would understand the patentee’s use of the term “substantially.” (Dkt. No. 124 at 13.) Plaintiff notes that Finisar’s own patent ubiquitously uses the term “substantially” in its claims. (Dkt. No. 139 at 4.) Plaintiff contends that as used in the relevant phrases of the patents-in-suit, the word “substantially” denotes language of magnitude. (Dkt. No. 124 at 13.) Thus, Plaintiff proposes that “substantially” means “largely” to clarify that its use in the claim is one of magnitude. (Dkt. No. 124 at 13.) Similarly, Plaintiff contends that the word “approximately” does not render the claims indefinite. (Dkt. No. 124 at 14.) Plaintiff notes that the Federal Circuit has used “approximately” as a construction for the term “about.” (Dkt. No. 124 at 14.) Thus, Plaintiff proposes that the word “approximately” be construed as “close to.” (Dkt. No. 124 at 14.)

As an initial matter, it well accepted that “patentable inventions cannot always be described in terms of exact measurements, symbols and formulae, and the applicant necessarily must use the meager tools provided by language, tools which admittedly lack exactitude and precision.” *Georgia-Pacific Corp. v. United States Plywood Corp.*, 258 F.2d 124, 136 (2d Cir. 1958), cert. denied, 358 U.S. 884 (1958). Therefore, “[e]xpressions such as ‘substantially’ are used in patent documents when warranted by the nature of the invention, in order to accommodate the minor variations that may be appropriate to secure the invention ... and indeed

may be necessary in order to provide the inventor with the benefit of his invention.” *Verve, LLC v. Crane Cams, Inc.*, 311 F.3d 1116, 1120 (Fed. Cir 2002). That said, the Court understands that “[w]hen a word of degree is used the district court must determine whether the patent’s specification provides some standard for measuring that degree.” *Seattle Box Co., Inc. v. Indus. Crating & Packing, Inc.*, 731 F.2d 818, 826 (Fed. Cir. 1984).

The Supreme Court’s recent holding in *Nautilus* does not overturn, or even address, the above-cited cases. To the contrary, the Supreme Court emphasized that the definiteness inquiry does not require “absolute precision” because, for example, the statute “must take into account the inherent limitations of language” and “[s]ome modicum of uncertainty . . . is the price of ensuring the appropriate incentives for innovation.” *Nautilus Inc. v. Biosig Instruments, Inc.*, 572 U.S. ___, 134 S. Ct. 2120, 2128-29 (2014). Accordingly, the Court will now turn to each phrase in light of the ordinary meaning of the phrases and the intrinsic evidence to determine if it informs, with reasonable certainty, those skilled in the art about the scope of the invention. *Id.* at 2124.

1. “substantially collimated by the focusing device when incident upon the SLM”

The Federal Circuit has noted “that the term ‘substantially’ has numerous ordinary meanings ... ‘substantially’ can mean ‘significantly’ or ‘considerably.’ The term ‘substantially’ can also mean ‘largely’ or ‘essentially.’” *Deering Precision Instruments, L.L.C. v. Vector Distrib. Sys.*, 347 F.3d 1314, 1322-1323 (Fed. Cir. 2003). Thus, “[s]ince the term ‘substantially’ is capable of multiple interpretations, we turn to the intrinsic evidence to determine which interpretation should be adopted.” *Deering*, 347 F.3d at 1323. The phrase “substantially collimated by the focusing device when incident upon the SLM” appears in claim 21 of the ’033 Patent. The claim further recites that it is the “light from a common point on the dispersion

device [that] is substantially collimated by the focusing device.” In this context, the specification informs, with reasonable certainty, those skilled in the art about the scope of the phrase “substantially collimated” by stating the following:

As the beams 741, 742 do not originate on the grating 720 from the same location, they are not mutually parallel when emerging from the lens 721. The beam 743 is from a point on the grating 720 common to the origin on the grating 720 of beam 742, and hence these beams are mutually parallel.

’710 Patent at 48:42-47. Furthermore, Figure 29 provides an illustration of light beams that are “substantially collimated” or mutually parallel (beams 742 and 743) and an illustration of light beams that are not “substantially collimated” (beams 742 and 741). *Deere & Co. v. Bush Hog, LLC*, 703 F.3d 1349, 1359 (Fed. Cir. 2012) (“This court has repeatedly confirmed that relative terms such as ‘substantially’ do not render patent claims so unclear as to prevent a person of skill in the art from ascertaining the scope of the claim.”) Accordingly, the Court finds that the phrase is not indefinite and that the term “substantially” is used as a term of magnitude. Therefore, the Court construes the phrase **“substantially collimated by the focusing device when incident upon the SLM”** to mean **“essentially collimated by the focusing device when incident upon the SLM”**

2. “substantially reflective”

The phrase “substantially reflective” appears in claim 9 of the ’710 Patent. The claim further recites that “the phase-modulating elements are substantially reflective, whereby emergent beams are deflected from the specular reflection direction.” The specification further states that “preferably the phase-modulating elements are substantially reflective, whereby emergent beams are deflected from the specular reflection direction.” ’710 Patent at 4:11-13. The specification further states that the “main beam has a zero order or specular reflection.” ’710 Patent at 47:7-8. Thus, the intrinsic evidence informs, with reasonable certainty, those

skilled in the art about the scope of the phrase “substantially reflective” in the context of a specular reflection. Accordingly, the Court finds that the phrase is not indefinite and that the term “substantially” is used as a term of magnitude. Therefore, the Court construes the phrase **“substantially reflective”** to mean **“largely reflective.”**

3. “a substantially non-reflective optical absorber” and “reflects substantially all of an incident light beam”

The phrase “a substantially non-reflective optical absorber” and the phrase “reflects substantially all of an incident light beam” appear in claim 37 of the ’683 Patent. The claim further recites displaying “a channel blocking hologram on at least one block of pixels, wherein the channel blocking hologram reflects substantially all of an incident light beam toward the substantially non-reflective optical absorber.” In this context, the specification informs, with reasonable certainty, those skilled in the art about the scope of the phrase “a substantially non-reflective optical absorber” by stating the following:

The power controlling hologram is selected to separate each beam into respective main 1a, 2a and subsidiary 1b, 2b beams, such that the main beams 1a, 2a are routed through the system and the or each subsidiary beam(s) 1b, 2b is/are diffracted out of the system, for example to a non-reflective absorber 97.

’710 Patent at 22:33–39. Furthermore, Figure 9 provides an illustration of channel blocking hologram reflecting substantially all of an incident light beam (1b, 2b) toward the substantially non-reflective optical absorber (97). Accordingly, the Court finds that the phrases are not indefinite and that the term “substantially” is used as a term of magnitude. Therefore, the Court construes the phrase **“a substantially non-reflective optical absorber”** to mean **“a largely non-reflective optical absorber,”** and the phrase **“reflects substantially all of an incident light beam”** to mean **“reflects largely all of an incident light beam.”**

4. “substantially at the centers of the respective different blocks of pixels”

The phrase “substantially at the centers of the respective different blocks of pixels” appears in claim 27 of the ’683 Patent. Claim 27 depends from claim 25, which recites “control circuitry operable to: divide the reflective LCOS SLM into discrete blocks of pixels ... and a wavelength separation device disposed to receive light from the input and operable to disperse the multiplex of optical signals at different wavelengths in different directions.” Claim 27 further recites “[t]he optical device of claim 25, operable to align central wavelengths of different channels substantially at the centers of the respective different blocks of pixels of the reflective LCOS SLM.” In this context, the specification informs, with reasonable certainty, those skilled in the art about the scope of the phrase “substantially at the centers of the respective different blocks of pixels” by stating the following:

To each wavelength channel there is assigned a block of pixels applying the same routing hologram. Preferably this block of pixels should be chosen such that an input light beam exactly at the centre wavelength for the channel arrives at the SLM such that the centre of the beam is within a half pixel’s width of the centre of the assigned pixel block.

’710 Patent at 51:6-13. Accordingly, the Court finds that the phrase is not indefinite and that the term “substantially” is used as a term of magnitude. Therefore, the Court construes the phrase **“substantially at the centers of the respective different blocks of pixels”** to mean **“essentially at the centers of the respective different blocks of pixels.”**

5. “substantially flat transmission between one or more pairs of adjacent channels at the output”

The phrase “substantially flat transmission between one or more pairs of adjacent channels at the output” appears in claim 44 of the ’683 Patent. Claim 44 further recites “control circuitry operable to: divide the reflective LCOS SLM into discrete blocks of pixels, display holograms on respective blocks of pixels to determine channels at an output, and control

adjacent blocks to achieve substantially flat transmission between one or more pairs of adjacent channels at the output.” In this context, the specification informs, with reasonable certainty, those skilled in the art about the scope of the phrase “substantially flat transmission between one or more pairs of adjacent channels at the output” by stating the following:

Independently of the clipping factor, the suppression at the edges of the wavelength channel is 6 dB and the full width half maximum (FWHM) filter bandwidth is approximately 80% of the channel separation. Comparison of the different curves in FIG. 19 shows that the flatter the filter passband the steeper the skirts at the edges, leading to greater extinction of the adjacent channel, as shown in FIG. 20.

This behaviour is advantageous as it avoids the usual tradeoff between adjacent channel extinction and centre flatness. Good centre flatness means that the filters concatenate better, so more routing nodes using such filters can be traversed by a signal before the signal spectrum and hence fidelity starts to deteriorate. Good adjacent channel extinction is also important as it prevents excessive accumulation of crosstalk corrupting the signal

’710 Patent at 52:28–43. Furthermore, Figure 19 shows the relative transmission T_{lo} for in-band wavelengths as a function of the ratio of the wavelength offset u to centre of the wavelength channel separation. Accordingly, the Court finds that the phrase is not indefinite and that the term “substantially” is used as a term of magnitude. Therefore, the Court construes the phrase **“substantially flat transmission between one or more pairs of adjacent channels at the output”** to mean **“largely flat transmission between one or more pairs of adjacent channels at the output.”**

6. “approximately a desired center wavelength of a respective channel”

Plaintiff contends that the ordinary meaning of the term “approximately” is “close to.” (Dkt. No. 124-11 at TS0104969, Merriam-Webster’s Collegiate Dictionary) (“approximate: to bring near or close”); (Dkt. No. 124-12 at TS0104978, Webster’s New World Dictionary) (“approximate: near in position; close together”). The Court agrees and now turns to the intrinsic evidence to determine if this plain and ordinary meaning applies to the disputed phrase.

The phrase “approximately a desired center wavelength of a respective channel” appears in claim 25 of the ’683 Patent. Claim 25 further recites “control circuitry operable to: divide the reflective LCOS SLM into discrete blocks of pixels, display holograms on respective blocks of pixels to determine channels at an output, and select the size, shape or position of one or more of said blocks of pixels to achieve at least approximately a desired center wavelength of a respective channel.” In this context, the specification informs, with reasonable certainty, those skilled in the art about the scope of the phrase “approximately a desired center wavelength of a respective channel” by stating the following:

For the purpose of calculating the wavelength filtering response it is assumed that the centre of the beam at the centre wavelength of the channel (shown as **500** in FIG. 27) arrives exactly at the centre of the associated pixel block.

’710 Patent at 51:51–54. Figure 27 illustrates an intensity distribution 510 for a beam under consideration and a center wavelength. Accordingly, the Court finds that the phrase is not indefinite. Therefore, the Court construes the phrase **“approximately a desired center wavelength of a respective channel”** to mean **“close to a desired center wavelength of a respective channel.”**

7. “approximately a desired passband of a respective channel”

The phrase “approximately a desired passband of a respective channel” appears in claim 20 of the ’683 Patent. Claim 20 further recites “control circuitry operable to: divide the reflective LCOS SLM into discrete blocks of pixels, display holograms on respective blocks of pixels to determine channels at an output, and select the size, shape or position of one or more of said blocks of pixels to achieve at least approximately a desired passband of a respective channel.” In this context, the specification informs, with reasonable certainty, those skilled in the art about the scope of the phrase “approximately a desired passband of a respective channel” by stating the following:


FIGS. 19 and 20 also show that a change in the width of the pixel block assigned to the filter passband (that is a change in CR) will change the passband width and extinction rate at the edges of the passband. Hence reconfigurable assignment of pixel blocks may be used to tune the shape and width of the filter pass bands.

'710 Patent at 52:22-28. Furthermore, the specification states that “[c]omparison of the different curves in FIG. 19 shows that the flatter the filter passband the steeper the skirts at the edges, leading to greater extinction of the adjacent channel.” ’710 Patent at 52:31-35. Accordingly, the Court finds that the phrase is not indefinite. Therefore, the Court construes the phrase **“approximately a desired passband of a respective channel”** to mean **“close to a desired passband of a respective channel.”**

V. CONCLUSION

The Court adopts the above constructions. The parties are ordered that they may not refer, directly or indirectly, to each other’s claim construction positions in the presence of the jury. Likewise, the parties are ordered to refrain from mentioning any portion of this opinion, other than the actual definitions adopted by the Court, in the presence of the jury. Any reference to claim construction proceedings is limited to informing the jury of the definitions adopted by the Court.

So ORDERED and SIGNED this 25th day of June, 2014.



RODNEY GILSTRAP
UNITED STATES DISTRICT JUDGE